We claim:

1. An adhesive composition consisting essentially of

i) a first aqueous mixture of about 20–60 wt/vol % serum albumin in about 0.01–0.25 molar buffer at a pH in a range of about 8.0–11.0,

ii) a second aqueous mixture of about 50–800 mg/ml of a crosslinking agent having a molecular weight in a range of about 1,000–15,000, wherein the crosslinking agent is of the formula

G—LM—PEG—LM—G

wherein —PEG— is a diradical fragment represented by the formula

$$-O-(CH_2-CH_2-O-)_a-$$

where a is an integer from 20–300;

wherein —LM— is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, —C(O)—, a monoester diradical of the formula, $-(CH_2)_bC(O)-$ where b is an integer from 1–5, a diester diradical of the formula, $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2–10 and where the aliphatic portion of the diradical may be saturated or unsaturated, a dicarbonate diradical of the formula $-C(O)-O-(CH_2)_d-O-C(O)-$ where d is an integer from 2–10, and an oligomeric diradical represented by the formulas —R—C(O)—, $-R-C(O)-(CH_2)_c-C(O)-$, or $-R-C(O)-O-(CH_2)_d-O-C(O)-$ where c is an integer from 2–10, d is an integer from 2–10, and R is a polymer or copolymer having 1–10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone and p-dioxanone; and

wherein —G is a leaving group selected from the group consisting of succinimidyl, maleimidyl, phthalimidyl, imidazolyl, nitrophenyl or tresyl, and

wherein a combination of the first and second mixtures is initially liquid and then cures on the surface of tissue to give a flexible, substantive matrix which bonds to the tissue and has a burst strength greater than about 10 mmHg.

2. The adhesive mixture of claim 1 wherein the protein in the first mixture is about 35–45 wt/vol % serum albumin.

3. The adhesive composition of claim 1 wherein the serum albumin is human serum albumin.

4. The adhesive composition of claim 1 wherein the buffer is 0.05–0.15 molar carbonate/bicarbonate buffer at a pH of about 9.0–10.5.

5. The adhesive composition of claim 1 wherein the second aqueous mixture is about 50–300 mg/ml of a crosslinking agent having a molecular weight in a range of about 1,000–5,000.

6. The adhesive composition of claim 1 wherein the ratio of a volume of the first mixture to a volume of the second mixture is in a range of about 1:10 to about 10:1.

7. The adhesive composition of claim 1 wherein —LM— is an oligomeric diradical $-R-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2–10 and R is a polymer or copolymer having 1–10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone and p-dioxanone.

8. The adhesive composition of claim 1 wherein —G is succinimidyl.

9. An in vivo method of adhering tissue comprising the steps of topically applying and bonding an adhesive mixture of claim 1 to the tissue.

10. An in vivo method of sealing air leaks in pulmonary tissues comprising the step of topically applying and curing the adhesive mixture of claims 1 to an air leak site in the pulmonary tissue.

11. An in vivo method to prevent post-surgical adhesions comprising the step of topically applying and curing the adhesive mixture of claims 1 to tissue surrounding a surgical site.

12. An in vivo method to seal tissue comprising the step of topically applying and bonding the adhesive mixture of claims 1 to tissue to prevent or control blood or other fluid leaks.

13. The adhesive composition of claim 1 wherein the second aqueous mixture is about 300–800 mg/ml of a crosslinking agent having a molecular weight in a range of about 5,000–15,000.

14. The adhesive composition of claim 13 wherein —LM— is a diester diradical of the formula —C(O)—$(CH_2)_2$—C(O)—.

15. The adhesive mixture of claim 1 wherein —LM— is a diester diradical of the formula, —C(O)—$(CH_2)_c$—C(O)— where c is an integer from 2–10 and where the aliphatic portion of the diradical may be saturated or unsaturated.

16. The adhesive composition of claim 15 wherein —LM— is a oligomeric diradical derived from polyglycolic acid.

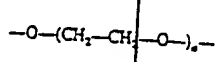
17. A method of making a tissue adhesive consisting of the step of forming a mixture of

i) a first aqueous mixture of about 20–60 wt/vol % serum albumin in about 0.01–0.25 molar buffer at a pH in a range of about 8.0–11.0,

ii) a second aqueous mixture of about 50–800 mg/ml of a crosslinking agent having a molecular weight in a range of about 1,000–15,000, wherein the crosslinking agent is of the formula

G—LM—PEG—LM—G

wherein —PEG— is a diradical fragment represented by the formula



where a is an integer from 20–300;

wherein —LM— is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, —C(O)—, a monoester diradical of the formula, —$(CH_2)_bC(O)$— where b is an integer from 1–5, a diester diradical of the formula, —C(O)—$(CH_2)_c$—C(O)—.where c is an integer from 2–10 and where the aliphatic portion of the diradical may be saturated or unsaturated, a dicarbonate diradical of the formula —C(O)—O—$(CH_2)_d$—O—C(O)— where d is an integer from 2–10, and an oligomeric diradical represented by the formulas —R—C(O)—, —R—C(O)—$(CH_2)_c$—C(O)—, or —R—C(O)—O—$(CH_2)_d$—O—C(O)— where c is an integer from 2–10, d is an integer from 2–10, and R is a polymer or copolymer having 1–10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone and p-dioxanone; and

wherein —G is a leaving group selected from the group consisting of succinimidyl, malcimidyl, phthalimidyl, imidazolyl, nitrophenyl or tresyl, and

wherein a combination of the first and second mixtures is initially liquid and then cures on the surface of tissue to give a flexible, substantive matrix which bonds to the tissue and has a burst strength greater than about 10 mmHg.

* * * * *

18. A method of treating tissue to prevent or control air or fluid leaks comprising:

providing a composition to tissue, said composition including an albumin protein and a crosslinking agent, said crosslinking agent having a polyoxyethylene chain portion and an activated leaving group which allows the crosslinking agent to react with said protein; and

curing said composition on the tissue to bond said composition to the tissue and to provide a substantive cured matrix.

19. The method of claim 18 wherein said composition is cured to produce the matrix in less than about 10 minutes.

20. The method of claim 18 wherein said composition is cured to produce the matrix in less than about one minute.

21. The method of claim 18 wherein said composition is cured to produce the matrix in about ten seconds.

22. The method of claim 18 comprising providing the composition to the tissue using a syringe.

23. The method of claim 18 comprising providing the composition to the tissue using a dual syringe.

24. The method of claim 18 comprising providing the composition to the tissue using a spray apparatus.

25. The method of claim 18 wherein the matrix is resorbed.

26. The method of claim 25 wherein the matrix is resorbed in about four to sixty days.

27. The method of claim 18 comprising curing the composition such that the peel strength of the matrix is about 0.08 lb/in or more.

28. The method of claim 18 comprising curing said composition to provide a cured matrix that has a burst pressure greater than about 10 mmHg.

29. The method of claim 27 wherein the matrix has a burst pressure of about 34 mmHg or greater.

30. The method of claim 29 wherein the matrix has a burst pressure of about 90 mmHg or greater.

31. The method of claim 30 wherein the matrix has a burst pressure of about 130 mmHg or greater.

32. The method of claim 18 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-15,000.

33. The method of claim 32 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-5,000.

34. The method of claim 18 comprising providing a composition wherein the activated leaving group is an N-hydroxy imide.

35. The method of claim 34 comprising providing a composition wherein the activated leaving group is N-hydroxy succinimide.

36. The method of claim 18 further comprising mixing a first mixture and a second mixture to form the composition and applying said composition to the tissue,

wherein the first mixture includes about 20-60 wt/vol% of the protein in about 0.01-0.25 molar buffer at a pH in a range of about 8.0-11.0 and the second mixture includes about 50-800 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-15,000.

37. The method of claim 36 wherein the crosslinking agent is of the formula

G-LM-PEG-LM-G

wherein:

-PEG- is a diradical fragment represented by the formula

$-O-(CH_2-CH_2-O-)_a-$

where a is an integer from 20-300;

-LM- is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, -C(O)-, a monoester diradical of the formula, $-(CH_2)_bC(O)-$ where b is an integer from 1-5, a diester radical of the formula, $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated, and a dicarbonate diradical of the formula $-C(O)-O-(CH_2)_d-O-C(O)-$ where d is an integer from 2-10, or an oligomeric diradical represented by the formulas $-R-C(O)-$, $-R-C(O)-(CH_2)_c-C(O)-$, or $-R-C(O)-O-(CH_2)_d-O-$ where c is an integer from 2-10, d is an integer from 2-10, and R is a polymer or copolymer having 1-10 monomeric fragments

selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone; and

-G is the leaving group selected from the group consisting of succinimidyl, maleimidyl, phthalimidyl, imidazolyl, nitrophenyl, or tresyl.

38. The method of claim 37 wherein the protein in the first mixture is about 35-45 wt/vol% serum albumin.

39. The method of claim 38 wherein the buffer is 0.05-0.15 molar carbonate/bicarbonate buffer at a pH of about 9.0-10.5.

40. The method of claim 37 wherein the second mixture is about 5-300 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-5,000.

41. The method of claim 37 wherein the ratio of a volume of the first mixture to a volume of the second mixture is in a range of about 1:10 to about 10:1.

42. The method of claim 37 wherein -LM- is an oligomeric diradical $-R-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone.

43. The method of claim 37 wherein -G is succinimidyl.

44. The method of claim 37 wherein the second mixture includes about 300-800 mg/ml of a crosslinking agent having a molecular weight in a range of about 5,000-15,000.

45. The method of claim 37 wherein -LM- is a diester diradical of the formula $-C(O)-(CH_2)_2-C(O)-$.

46. The method of claim 37 wherein -LM- is a diester diradical of the formula $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated.

47. The method of claim 37 wherein -LM- is an oligomeric diradical derived from polyglycolic acid.

48. The method of claim 18 comprising treating tissue to prevent or control a fluid leak.

49. The method of claim 48 wherein the fluid leak is a blood leak.

50. The method of claim 18 wherein the tissue includes an air leak.

51. The method of claim 50 wherein the air leak is in the pulmonary system.

52. A method of treating tissue to prevent formation of an adhesion comprising:

providing a composition to tissue, said composition including an albumin protein and a crosslinking agent, said crosslinking agent having a polyoxyethylene chain portion

and an activated leaving group which allows the crosslinking agent to react with said protein; and

curing said composition on the tissue to bond said composition to the tissue and to provide a substantive cured matrix.

53. The method of claim 52 wherein said composition is cured to produce the matrix in less than about 10 minutes.

54. The method of claim 52 wherein said composition is cured to produce the matrix in less than about one minute.

55. The method of claim 52 wherein said composition is cured to produce the matrix in about ten seconds.

56. The method of claim 52 comprising providing the composition to the tissue using a syringe.

57. The method of claim 52 comprising providing the composition to the tissue using a dual syringe.

58. The method of claim 52 comprising providing the composition to the tissue using a spray apparatus.

59. The method of claim 52 wherein the matrix is resorbed.

60. The method of claim 59 wherein the matrix is resorbed in about four to sixty days.

61. The method of claim 52 comprising curing the composition such that the peel strength of the matrix is about 0.08 lb/in or more.

62. The method of claim 52 comprising curing said composition to provide a cured matrix that has a burst pressure greater than about 10 mmHg.

63. The method of claim 62 wherein the matrix has a burst pressure of about 34 mmHg or greater.

64. The method of claim 63 wherein the matrix has a burst pressure of about 90 mmHg or greater.

65. The method of claim 64 wherein the matrix has a burst pressure of about 130 mmHg or greater.

66. The method of claim 52 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-15,000.

67. The method of claim 66 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-5,000.

68. The method of claim 52 comprising providing a composition wherein the activated leaving group is an N-hydroxy imide.

69. The method of claim 68 comprising providing a composition wherein the activated leaving group is N-hydroxy succinimide.

70. The method of claim 52 further comprising mixing a first mixture and a second mixture to form the composition and applying said composition to the tissue,

wherein the first mixture includes about 20-60 wt/vol% of the protein in about 0.01-0.25 molar buffer at a pH in a range of about 8.0-11.0 and the second mixture includes about 50-800 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-15,000.

71. The method of claim 70 wherein the crosslinking agent is of the formula

G-LM-PEG-LM-G

wherein:

-PEG- is a diradical fragment represented by the formula

$-O-(CH_2-CH_2-O-)_a-$

where a is an integer from 20-300;

-LM- is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, -C(O)-, a monoester diradical of the formula, $-(CH_2)_bC(O)-$ where b is an integer from 1-5, a diester radical of the formula, $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated, and a dicarbonate diradical of the formula $-C(O)-O-(CH_2)_d-O-C(O)-$ where d is an integer from 2-10, or an oligomeric diradical represented by the formulas -R-C(O)-, $-R-C(O)-(CH_2)_c-C(O)-$, or $-R-C(O)-O-(CH_2)_d-O-$ where c is an integer from 2-10, d is an integer from 2-10, and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone; and

-G is the leaving group selected from the group consisting of succinimidyl, maleimidyl, phthalimidyl, imidazolyl, nitrophenyl, or tresyl.

72. The method of claim 71 wherein the protein in the first mixture is about 35-45 wt/vol% serum albumin.

73. The method of claim 72 wherein the buffer is 0.05-0.15 molar carbonate/bicarbonate buffer at a pH of about 9.0-10.5.

74. The method of claim 71 wherein the second mixture is about 5-300 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-5,000.

75. The method of claim 71 wherein the ratio of a volume of the first mixture to a volume of the second mixture is in a range of about 1:10 to about 10:1.

76. The method of claim 71 wherein -LM- is an oligomeric diradical $-R-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone.

77. The method of claim 71 wherein -G is succinimidyl.

78. The method of claim 71 wherein the second mixture includes about 300-800 mg/ml of a crosslinking agent having a molecular weight in a range of about 5,000-15,000.

79. The method of claim 71 wherein -LM- is a diester diradical of the formula $-C(O)-(CH_2)_2-C(O)-$.

80. The method of claim 71 wherein -LM- is a diester diradical of the formula $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated.

81. The method of claim 71 wherein -LM- is an oligomeric diradical derived from polyglycolic acid.

82. The method of claim 52 wherein the composition is provided to tissue at a surgical site.

83. The method of claim 52 wherein the composition is provided on a surface of an internal organ.

84. A method of treating tissue to bind layers of tissue together comprising:

providing a composition to tissue, said composition including an albumin protein and a crosslinking agent, said crosslinking agent having a polyoxyethylene chain portion and an activated leaving group which allows the crosslinking agent to react with said protein; and

curing said composition on the tissue to bond said composition to the tissue and to provide a substantive cured matrix.

85. The method of claim 84 wherein said composition is cured to produce the matrix in less than about 10 minutes.

86. The method of claim 84 wherein said composition is cured to produce the matrix in less than about one minute.

87. The method of claim 84 wherein said composition is cured to produce the matrix in about ten seconds.

88. The method of claim 84 comprising providing the composition to the tissue using a syringe.

89. The method of claim 84 comprising providing the composition to the tissue using a dual syringe.

90. The method of claim 84 comprising providing the composition to the tissue using a spray apparatus.

91. The method of claim 84 wherein the matrix is resorbed.

92. The method of claim 91 wherein the matrix is resorbed in about four to sixty days.

93. The method of claim 84 comprising curing the composition such that the peel strength of the matrix is about 0.08 lb/in or more.

94. The method of claim 84 comprising curing said composition to provide a cured matrix that has a burst pressure greater than about 10 mmHg.

95. The method of claim 94 wherein the matrix has a burst pressure of about 34 mmHg or greater.

96. The method of claim 95 wherein the matrix has a burst pressure of about 90 mmHg or greater.

97. The method of claim 96 wherein the matrix has a burst pressure of about 130 mmHg or greater.

98. The method of claim 84 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-15,000.

99. The method of claim 98 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-5,000.

100. The method of claim 84 comprising providing a composition wherein the activated leaving group is an N-hydroxy imide.

101. The method of claim 100 comprising providing a composition wherein the activated leaving group is N-hydroxy succinimide.

102. The method of claim 84 further comprising mixing a first mixture and a second mixture to form the composition and applying said composition to the tissue,

wherein the first mixture includes about 20-60 wt/vol% of the protein in about 0.01-0.25 molar buffer at a pH in a range of about 8.0-11.0 and the second mixture includes about 50-800 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-15,000.

103. The method of claim 102 wherein the crosslinking agent is of the formula

G-LM-PEG-LM-G

wherein:

-PEG- is a diradical fragment represented by the formula

$-O-(CH_2-CH_2-O-)_a-$

where a is an integer from 20-300;

-LM- is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, -C(O)-, a monoester diradical of the formula, $-(CH_2)_bC(O)-$ where b is an integer from 1-5, a diester radical of the formula, $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated, and a dicarbonate diradical of the formula $-C(O)-O-(CH_2)_d-O-C(O)-$ where d is an integer from 2-10, or an oligomeric diradical represented by the formulas $-R-C(O)-$, $-R-C(O)-(CH_2)_c-C(O)-$, or $-R-C(O)-O-(CH_2)_d-O-$ where c is an integer from 2-10, d is an integer from 2-10, and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone; and

-G is the leaving group selected from the group consisting of succinimidyl, maleimidyl, phthalimidyl, imidazolyl, nitrophenyl, or tresyl.

104. The method of claim 103 wherein the protein in the first mixture is about 35-45 wt/vol% serum albumin.

105. The method of claim 104 wherein the buffer is 0.05-0.15 molar carbonate/bicarbonate buffer at a pH of about 9.0-10.5.

106. The method of claim 103 wherein the second mixture is about 5-300 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-5,000.

107. The method of claim 103 wherein the ratio of a volume of the first mixture to a volume of the second mixture is in a range of about 1:10 to about 10:1.

108. The method of claim 103 wherein -LM- is an oligomeric diradical -R-C(O)-$(CH_2)_c$-C(O)- where c is an integer from 2-10 and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone.

109. The method of claim 103 wherein -G is succinimidyl.

110. The method of claim 103 wherein the second mixture includes about 300-800 mg/ml of a crosslinking agent having a molecular weight in a range of about 5,000-15,000.

111. The method of claim 103 wherein -LM- is a diester diradical of the formula -C(O)-$(CH_2)_2$-C(O)-.

112. The method of claim 103 wherein -LM- is a diester diradical of the formula -C(O)-$(CH_2)_c$-C(O)- where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated.

113. The method of claim 103 wherein -LM- is an oligomeric diradical derived from polyglycolic acid.

114. The method of claim 84 wherein the matrix binds tissue together in addition to a suture, a staple, a tape, or a bandage.

115. The method of claim 84 wherein the composition is provided to attach skin grafts.

116. The method of claim 84 wherein the composition is provided to attach adjacent layers of tissue.

117. The method of claim 84 wherein the composition is provided to position tissue flaps.

118. The method of claim 84 wherein the composition is provided to close gingival flaps.

119. A method of treating tissue comprising:

providing a composition to tissue, said composition including an albumin protein and a crosslinking agent, said crosslinking agent having a polyoxyethylene chain portion and an activated leaving group which allows the crosslinking agent to react with said protein; and

curing said composition on the tissue to bond said composition to the tissue and to provide a substantive cured matrix.

120. The method of claim 119 wherein said composition is cured to produce the matrix in less than about 10 minutes.

121. The method of claim 119 wherein said composition is cured to produce the matrix in less than about one minute.

122. The method of claim 119 wherein said composition is cured to produce the matrix in about ten seconds.

123. The method of claim 119 comprising providing the composition to the tissue using a syringe.

124. The method of claim 119 comprising providing the composition to the tissue using a dual syringe.

125. The method of claim 119 comprising providing the composition to the tissue using a spray apparatus.

126. The method of claim 119 wherein the matrix is resorbed.

127. The method of claim 126 wherein the matrix is resorbed in about four to sixty days.

128. The method of claim 119 comprising curing the composition such that the peel strength of the matrix is about 0.08 lb/in or more.

129. The method of claim 119 comprising curing said composition to provide a cured matrix that has a burst pressure greater than about 10 mmHg.

130. The method of claim 94 wherein the matrix has a burst pressure of about 34 mmHg or greater.

131. The method of claim 95 wherein the matrix has a burst pressure of about 90 mmHg or greater.

132. The method of claim 96 wherein the matrix has a burst pressure of about 130 mmHg or greater.

133. The method of claim 119 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-15,000.

134. The method of claim 133 comprising providing a composition wherein the crosslinking agent has a molecular weight in a range of about 1,000-5,000.

135. The method of claim 119 comprising providing a composition wherein the activated leaving group is an N-hydroxy imide.

136. The method of claim 135 comprising providing a composition wherein the activated leaving group is N-hydroxy succinimide.

137. The method of claim 119 further comprising mixing a first mixture and a second mixture to form the composition and applying said composition to the tissue,

wherein the first mixture includes about 20-60 wt/vol% of the protein in about 0.01-0.25 molar buffer at a pH in a range of about 8.0-11.0 and the second mixture includes about 50-800 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-15,000.

138. The method of claim 137 wherein the crosslinking agent is of the formula

G-LM-PEG-LM-G

wherein:

-PEG- is a diradical fragment represented by the formula

$-O-(CH_2-CH_2-O-)_a-$

where a is an integer from 20-300;

-LM- is a diradical fragment selected from the group consisting of a carbonate diradical of the formula, -C(O)-, a monoester diradical of the formula, $-(CH_2)_bC(O)-$ where b is an integer from 1-5, a diester radical of the formula, $-C(O)-(CH_2)_c-C(O)-$ where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated, and a dicarbonate diradical of the formula $-C(O)-O-(CH_2)_d-O-C(O)-$ where d is an integer from 2-10, or an oligomeric diradical represented by the formulas $-R-C(O)-$, $-R-C(O)-(CH_2)_c-C(O)-$, or $-R-C(O)-O-(CH_2)_d-O-$ where c is an integer from 2-10, d is an integer from 2-10, and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone; and

-G is the leaving group selected from the group consisting of succinimidyl, maleimidyl, phthalimidyl, imidazolyl, nitrophenyl or tresyl.

139. The method of claim 138 wherein the protein in the first mixture is about 35-45 wt/vol% serum albumin.

140. The method of claim 139 wherein the buffer is 0.05-0.15 molar carbonate/bicarbonate buffer at a pH of about 9.0-10.5.

141. The method of claim 138 wherein the second mixture is about 5-300 mg/ml of the crosslinking agent having a molecular weight in a range of about 1,000-5,000.

142. The method of claim 138 wherein the ratio of a volume of the first mixture to a volume of the second mixture is in a range of about 1:10 to about 10:1.

143. The method of claim 138 wherein -LM- is an oligomeric diradical -R-C(O)-$(CH_2)_c$-C(O)- where c is an integer from 2-10 and R is a polymer or copolymer having 1-10 monomeric fragments selected from the group consisting of lactide, glycolide, trimethylene carbonate, caprolactone, and p-dioxanone.

144. The method of claim 138 wherein -G is succinimidyl.

145. The method of claim 138 wherein the second mixture includes about 300-800 mg/ml of a crosslinking agent having a molecular weight in a range of about 5,000-15,000.

146. The method of claim 138 wherein -LM- is a diester diradical of the formula -C(O)-$(CH_2)_2$-C(O)-.

147. The method of claim 138 wherein -LM- is a diester diradical of the formula -C(O)-$(CH_2)_c$-C(O)- where c is an integer from 2-10 and where the aliphatic portion of the diradical may be saturated or unsaturated.

148. The method of claim 138 wherein -LM- is an oligomeric diradical derived from polyglycolic acid.

149. The method of claim 119 comprising curing the composition on the tissue to seal the tissue.

150. The method of claim 149 comprising treating tissue to prevent or control a fluid leak.

151. The method of claim 150 wherein the fluid leak is a blood leak.

152. The method of claim 149 wherein the tissue includes an air leak.

153. The method of claim 152 wherein the air leak is in the pulmonary system.

154. The method of claim 119 wherein the composition is provided to tissue at a surgical site.

155. The method of claims 119 comprising curing the composition at the tissue to prevent a tissue adhesion.

156. The method of claim 119 wherein the composition is provided on a surface of an internal organ.

157. The method of claim 119 comprising curing the composition to form a matrix to bind tissue.

158. The method of claim 157 wherein the matrix binds tissue together in addition to a suture, a staple, a tape, or a bandage.

159. The method of claim 119 wherein the composition is provided to attach skin grafts.

160. The method of claim 119 wherein the composition is provided to attach adjacent layers of tissue.

161. The method of claim 119 wherein the composition is provided to position tissue flaps.

162. The method of claim 119 wherein the composition is provided to close gingival flaps.